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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,478	12/20/2001	Richard Pederson	3123-394	5465

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EXAMINER	
RODRIGUEZ, GLENDA P	

ART UNIT	PAPER NUMBER
2627	

DATE MAILED: 08/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

A.

Office Action Summary	Application No.	Applicant(s)	
	10/029,478	PEDERSON ET AL.	
	Examiner	Art Unit	
	Glenda P. Rodriguez	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21-30, 51-70* is/are allowed.

6)☒ Claim(s) *31-45* is/are rejected.

7)☒ Claim(s) *46-50* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 41 is objected to because of the following informalities: it claims "servo information" being read when in the parent Claim 31 there is no mention that the data being read is either user or servo data. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 31, 32, 33, 34, 35 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Cunningham (US Patent No. 5, 978, 163).

Regarding Claim 31, Cunningham teaches a disk drive that includes a disk and a head that reads from and writes to the disk, wherein the head writes to the disk in responses to write current, a method of compensation the write current for a temperature of the disk drive, the method of comprising:

Measuring an ambient temperature of the disk drive (Col. 7, L. 15-30);

Providing a first write current with acceptable bit error rate at the ambient temperature by adjusting an initial write current (Col. 7, L. 23-30, Col. 8, L. 18-22 and Col. 10, L. 42-47, wherein Cunningham teaches that by adjusting the current to a temperature reduces the bit error rate to an acceptable error rate.);

Providing a second write current with acceptable stability of the head at the ambient temperature by adjusting the first write current (Col. 8, L. 18-22, wherein the current is said to be adjusted in order to maintain a stable error rate in the MR head.).

Regarding Claim 32, Cunningham teaches all the limitations of Claim 31. Cunningham further teach wherein measuring the ambient temperature includes measuring an internal temperature of the disk drive using a temperature sensor in the disk drive and determining the ambient temperature based on the internal temperature (Element 105, which is the temperature sensor).

Regarding Claim 33, Cunningham teaches all the limitations of Claim 32. Cunningham further teaches wherein the temperature sensor is in a read/write channel in the disk drive (Fig. 2, Element 105).

Regarding Claim 35, Cunningham teaches all the limitations of Claim 32. Cunningham further teaches wherein the temperature sensor is in a cavity in the disk drive (Fig. 1, Element 105).

Regarding Claim 41, Cunningham teaches all the limitations of Claim 31. Cunningham further teaches wherein providing the second write current includes: reading servo information from the disk using the head; and changing the write current in response to an error in the read servo information (See Col. 2, L. 25-32 and Col. 9, L. L. 41-49, wherein Cunningham teaches that the read head reads the data and mentions varying the current according to the temperature being read. Cunningham also mentions the link that the temperature and bias current cause on the bit error rate.).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 36-40, 42, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cunningham in view of Madsen et al. (US Patent No. 5, 600, 500).

Regarding Claim 36, Cunningham teaches all the limitations of Claim 32. However, Cunningham does not explicitly teach wherein providing the first write current includes: writing a test sequence to the disk using the head; reading the test sequence from the disk using the head; measuring a bit error rate of the read test sequence; comparing the measured bit error rate to a threshold; and changing the write current in response to the comparison. Madsen teaches these steps in Fig. 3 Steps 74, 78, 84, 86 and 90. It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Cunningham's invention with the teaching of Madsen et al. in order to optimize the write current as taught in the Abstract of Madsen et al.

Regarding Claim 37, the combination of Cunningham and Madsen et al. teach all the limitations of Claim 36. The combination further teach including increasing the write current if the measured bit error rate is less than the threshold (Col. 8, L. 18-22 of Cunningham).

Regarding Claim 38, the combination of Cunningham and Madsen et al. teach all the limitations of Claim 36. The combination further teach wherein decreasing the write current if the measured bit error rate is greater than the threshold (Element 90 of Madsen et al.).

Regarding Claim 39, the combination of Cunningham and Madsen et al. teaches all the limitations of Claim 36. The combination further teach wherein including increasing the write current if the measured bit error rate is less than the threshold (Col. 8, L. 18-22 of Cunningham) and then repeating the writing, the reading, the bit error rate measuring, the comparing and the changing for the increased write current (Fig. 3 Steps 74, 78, 84, 86 and 90 of Madsen et al.).

Regarding Claim 40, the combination of Cunningham and Madsen et al. teaches all the limitations of Claim 36. The combination further teach wherein including decreasing the write current if the measured bit error rate is greater than the threshold and then repeating the writing, the reading, the bit error rate measuring, the comparing and the changing for the decreased write current (Fig. 3 Steps 74, 78, 84, 86 and 90 of Madsen et al.).

Regarding Claim 42, Cunningham teaches all the limitations of Claim 41. However, Cunningham does not explicitly teach wherein writing a test sequence to the disk using the head, thereby heating the head, and then reading the servo information immediately following writing the test sequence. Madsen et al. teaches writing information (Element 74, it is obvious that the head when performing a write operation, the head is heated due to the use of a bias current) and reading information (Element 78 of Madsen et al. It is obvious that the read head reads servo and data information.).

Regarding Claim 44, Cunningham teaches all the limitations of Claim 41. However, Cunningham does not explicitly teach wherein including decreasing the write current in response to the error. This is taught by Madsen et al. in Fig. 3, Element 90.

Regarding Claim 45, Cunningham teaches all the limitations of Claim 41. However, Cunningham does not explicitly teach including decreasing the write current in response to the

error (Element 90) and then repeating the reading and the changing for the decreased write current (See Fig. 3, Elements 90 and 78, which are repeated if the current is decreased.).

6. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cunningham in view of Fisher (US Patent No. 5, 384, 671). Cunningham teaches all the limitations of Claim 41. However, Cunningham does not explicitly teach wherein including generating the error in response to failing to recover gray code in the servo information. This is taught by Fisher in Col. 2, L. 59-64. It would have been obvious to a person of ordinary skill in the art, at the time the invention was made to modify Cunningham's invention with the teaching of Fisher et al. in order to achieve robust gray code decoding.

7. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cunningham in view of Blachek et al. (US Patent No. 6, 169, 930). Cunningham teaches all the limitations of Claim 32. However, Cunningham does not explicitly teach wherein the temperature sensor is in a preamplifier in the disk drive. This is taught by Blachek et al. in Col. 3, L. 14-29. It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Cunningham's invention with the teaching of Blachek et al. in order to maintain the disk drive temperature at a normal level as taught by Blachek et al. in Col. 2, L. 61-64.

Allowable Subject Matter

8. Claims 21-30 and 51-70 are allowed.

9. Claims 46-50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the primary reason for allowable subject matter is the inclusion of the limitation wherein providing a third write current with acceptable pole tip protrusion of the head at the ambient temperature by adjusting the second write current.

10. The following is an examiner's statement of reasons for allowance:

Regarding Claim 1, the primary reason for allowance is the inclusion of the limitation of a method wherein reducing the maximum current until the write induced instability test is satisfied.

Regarding Claim 25, the primary reason for allowance is the inclusion of the limitation of a method wherein in response to detecting at least one of an error reading servo sector position information from the track using the head and a position error signal indicating a change in position of the head relative to the track, decreasing the nominal write current.

Regarding Claim 51, the primary reason for allowance is the inclusion of the limitation of a method wherein decreasing the write current in response to an error in the read servo information.

Regarding Claim 61, the primary reason for allowance is the inclusion of the limitation of a method wherein decreasing the write current and repeating steps (vi) through (viii) in response to an error in the read servo information, otherwise setting the second write current to the write current in step (vi).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

11. Applicant's arguments with respect to claims 21-70 have been considered but are moot in view of the new ground(s) of rejection due to the newly added Claims 28-70.

12. Claims 21-29 and 51-70 have been allowed and newly added Claims 31-45 have been rejected and Claims 46-50 have been objected.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US Patent No. 6, 603, 617 to Cross, US Patent No. 6, 950, 266 to McCaslin et al., US Patent No. 7, 023, 645 to Emo et al. and US Patent No. 6, 995, 933 to Codilian et al.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenda P. Rodriguez whose telephone number is (571) 272-7561. The examiner can normally be reached on Monday thru Thursday: 7:00-5:00; alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

gpr
08/23/06.

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER